

REMARKS

The Office Action dated September 28, 2005 has been received and reviewed by the applicant. Claims 1-24 are in the application.

Claims 1-8 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Madan et al. (US 6,214,706).

Claims 1-8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rakhimov et al. (US 6,042,900).

The applicants acknowledge and confirm the election of method claims 1-8 without traverse in response to the Examiner's restriction and have canceled claims 9-24, accordingly. Additionally, new claim 25 incorporates the materials that were previously listed in independent claim 24.

The present invention is directed to a method for forming a diamond coating on a substrate in a sealed chamber. One combines a graphite rod and a metal wire wrapped around this rod as a means for forming precursors for diamond deposition and places the substrate and the combined graphite rod and metal wire into a chamber. The chamber is filled with hydrogen and the ambient pressure in the chamber is reduced below 1 atmosphere. The chamber is sealed such that the ambient pressure in the chamber remains below 1 atmosphere and the hydrogen is contained within the sealed chamber and there is no flow of gas in or out during diamond deposition. Subsequently, a voltage is applied to the graphite rod until the substrate is heated within a range of 125°C-750°C.

The Applicants have devised a novel diamond deposition process that is divergent from previous methods in that their diamond deposition process occurs

within a sealed chamber that has no gas flowing in or out of the deposition chamber. Additionally in the instant application, hydrocarbons from a non-electrified wire and graphite rod combination enable the deposition process upon a substrate to occur at heretofore unheard of low temperatures (as low as 125°C). The Applicants have amended claim 1 to emphasize that the sealed chamber has no gas flowing in or out of it during the deposition process. Support for the amendment can be found on page 7, lines 23-30 of the Applicants' specification. Also, the Applicants have amended claims 1-3 to more distinctly claim their invention.

The cited art of Madan and Rakhimov both disclose the continuous flow of gas through the deposition chamber during deposition. The claimed invention seals the chamber to prevent any gas from flowing in or out of the chamber during deposition. Moreover, the claimed invention utilizes a graphite rod as a reactant with a metal wire as a catalyst wrapped around the rod in order to produce precursor chemicals that enable diamond deposition upon a substrate. Specifically, the graphite rod reacts with the hydrogen in the sealed chamber and produces hydrocarbons. The graphite rod heats the substrate, primarily by radiation. On the other hand, Madan touts the chemical inertness of sole graphite rods. Madan et al. state, "...graphite is chemically more inert than metal. Hence, graphite rods in accordance with this invention do not react with silicon or hydrogen radicals as easily as do thin metal filaments." Col. 9, lines 42-45 of Madan '706. Consequently, Madan teaches away from combining graphite rods with metal wire, because such a combination in hydrogen gas would cause a non-welcoming reaction.

In addition, Madan discloses only "diamond-like" coatings, not diamond coatings. The Examiner has already asserted the different crystalline structure for diamonds compared with "diamond-like" in his Office Action of September 28, 2005.

It is believed that independent claim 1 is unobvious in light of both Madan and Rakhimov. The remaining claims are dependent from these claims and are considered to be patentable for at least the same reasons.

Should the Examiner consider that additional amendments are necessary to place the application in condition for allowance, the favor is requested of a telephone call to the undersigned counsel for the purpose of discussing such amendments.

For the reasons set forth above, it is believed that the application is in condition for allowance. Accordingly, reconsideration of the listed claims as now written and corresponding favorable action regarding them is respectfully solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Stephen H. Shaw", is written over a horizontal line.

Attorney for Applicant(s)
Registration No. 45,404

Stephen H. Shaw/set
Rochester, NY 14650
Telephone: 585-477-7419
Facsimile: 585-477-4646

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.